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A Qualitative Explanation of How Business Intelligence Is Utilized in the Tourism and Hospitality Industry: A Grounded Theory Approach

ABSTRACT

Digital transformation and the proliferation of data-driven technologies, particularly Business Intelligence (BI), have fundamentally reshaped decision-making patterns and value creation processes in the tourism industry. However, the manner in which analytical data are transformed into organizational capabilities capable of enhancing the performance of tourism enterprises has not yet been fully explained. The aim of this study was to explain the role of Business Intelligence in the development of dynamic capabilities within organizations operating in Iran's tourism industry. To achieve this objective, the study adopted a qualitative approach using the Grounded Theory methodology. Research data were collected through 21 in-depth semi-structured interviews with senior executives, information technology managers, digital marketing specialists, and data analysts working in hotels, reservation platforms, and travel agencies. Data analysis was conducted based on the systematic model of Strauss and Corbin and involved three stages: open coding, axial coding, and selective coding. The findings revealed that the institutionalization of data-driven strategic agility serves as the core category and plays a central role in linking Business Intelligence with the development of dynamic capabilities. The results further indicated that market turbulence and the expansion of the digital data ecosystem function as causal conditions that drive organizations toward the adoption of Business Intelligence. In this context, factors such as technology-oriented strategic orientation, legacy systems, and a data-driven culture were identified as contextual conditions, while information silos, skill gaps, and infrastructural limitations emerged as intervening conditions influencing the utilization of data. In response to these conditions, organizations reconfigure their resources and processes by adopting strategies such as AI-driven service reengineering, dynamic capacity and pricing management, and customer experience analytics. The outcomes of this process include service personalization, enhanced strategic resilience, and increased brand value in the digital environment. The findings suggest that Business Intelligence extends beyond being merely an analytical tool and functions as a key mechanism for strengthening dynamic capabilities and enhancing strategic agility within tourism organizations. By presenting a grounded conceptual model, this study contributes to the literature on digital transformation and dynamic capabilities in the tourism industry and provides managerial implications for developing data-driven decision-making and effectively leveraging analytical technologies.

Keywords: Business Intelligence, Dynamic Capabilities, Data-Driven Decision-Making, Digital Transformation, Tourism Industry, Grounded Theory.

Introduction

The tourism and hospitality industry has undergone profound transformation in recent years as a result of digitalization, the proliferation of smart technologies, and the unprecedented growth of data generated through customer interactions, online platforms, reservation systems, and social media. These developments have altered traditional approaches to organizational management and strategic decision-making, compelling tourism organizations to adopt data-driven methods

for maintaining competitiveness and achieving sustainable growth. In an increasingly complex and uncertain environment, organizations can no longer rely solely on managerial intuition and historical experience. Instead, they must continuously collect, process, analyze, and interpret large volumes of information in order to identify emerging opportunities, anticipate market changes, and respond effectively to evolving customer expectations [1, 2].

The rapid expansion of digital technologies has significantly increased the volume, velocity, and variety of data available to organizations. These changes have elevated the strategic importance of Business Intelligence (BI) as a managerial capability that transforms raw data into meaningful information and actionable knowledge. Business Intelligence encompasses a set of technologies, analytical tools, processes, and managerial practices that enable organizations to collect data from multiple sources, integrate information, identify patterns, and support evidence-based decision-making. Rather than serving merely as a technological solution, BI has emerged as a strategic resource capable of improving organizational effectiveness, enhancing operational performance, and facilitating long-term competitiveness [1, 3, 4].

The increasing importance of Business Intelligence is particularly evident in service industries characterized by intense competition, fluctuating demand, and rapidly changing customer preferences. Tourism represents one of the most data-intensive service sectors, where organizations must constantly monitor market trends, traveler behaviors, booking patterns, customer reviews, and competitive activities. The digitalization of tourism services has generated extensive data streams from online reservation systems, customer relationship management platforms, social media interactions, mobile applications, and destination management systems. Consequently, tourism organizations are increasingly investing in analytical infrastructures and intelligent technologies to leverage these data assets for strategic purposes [5-7].

Recent advances in artificial intelligence, machine learning, predictive analytics, and big data technologies have further expanded the capabilities of Business Intelligence systems. Modern BI platforms can process vast quantities of structured and unstructured data, generate predictive insights, automate decision-support functions, and identify complex patterns that are often inaccessible through traditional analytical approaches. The integration of artificial intelligence with Business Intelligence has enabled organizations to move beyond descriptive analytics toward predictive and prescriptive decision-making, thereby enhancing organizational agility and strategic responsiveness [4, 8, 9]. These technological developments have become particularly relevant in tourism and hospitality, where customer preferences evolve rapidly and market conditions are frequently affected by economic, political, environmental, and social disruptions.

The literature increasingly highlights the role of Business Intelligence as a critical enabler of organizational performance. Studies have demonstrated that BI contributes to improved financial outcomes, enhanced resource allocation, greater operational efficiency, and more effective strategic planning. By providing managers with timely and accurate information, BI reduces uncertainty and facilitates informed decision-making across various organizational levels [3, 10]. Moreover, BI supports innovation processes by enabling organizations to identify emerging trends, understand customer needs, and develop new products and services aligned with market demands [8, 11].

Beyond operational improvements, scholars have increasingly emphasized the strategic value of Business Intelligence in fostering organizational adaptability and resilience. Contemporary organizations operate in environments characterized by technological disruption, competitive turbulence, and increasing uncertainty. Under such conditions, sustainable success depends not only on possessing valuable resources but also on the ability to continuously adapt and reconfigure those resources in response to environmental changes. This perspective aligns closely with the theory of dynamic capabilities, which

emphasizes an organization's ability to sense opportunities and threats, seize opportunities through strategic action, and reconfigure resources to maintain competitiveness in changing environments [12].

Dynamic capabilities have emerged as one of the most influential theoretical frameworks for understanding organizational adaptation and competitive advantage in volatile markets. According to this perspective, organizations achieve sustainable success not simply through resource ownership but through their capacity to continuously renew, integrate, and transform resources in response to environmental changes. In the tourism industry, where demand patterns are highly volatile and customer expectations evolve rapidly, dynamic capabilities play a particularly critical role. Tourism organizations must constantly monitor market developments, identify emerging opportunities, adapt service offerings, and redesign operational processes to remain competitive [9, 13].

The relationship between Business Intelligence and dynamic capabilities has attracted growing scholarly attention in recent years. Researchers argue that BI serves as a foundational mechanism through which organizations acquire environmental knowledge, generate strategic insights, and support adaptive decision-making. By enhancing information processing capabilities and improving organizational learning, BI can strengthen sensing capabilities through better environmental scanning, support seizing capabilities through more informed strategic decisions, and facilitate reconfiguring capabilities through evidence-based resource allocation and organizational transformation [12, 14]. Nevertheless, despite the theoretical relevance of this relationship, the precise mechanisms through which Business Intelligence contributes to the development of dynamic capabilities remain insufficiently understood.

Several empirical studies have explored the effects of Business Intelligence on organizational performance and strategic outcomes. Research has demonstrated positive relationships between BI adoption and sustainable performance, innovation capability, organizational intelligence, and strategic effectiveness [11, 15]. Other studies have highlighted the importance of data quality, analytical capabilities, and technological readiness in determining the success of BI initiatives [16, 17]. Furthermore, investigations in diverse sectors have shown that organizations capable of effectively integrating analytics into decision-making processes are better positioned to achieve competitive advantage and respond to environmental challenges [14, 18].

Despite these advances, significant gaps remain in the existing literature. First, much of the current research has focused on quantitative examinations of relationships among predefined variables, often relying on survey-based methodologies and causal models. While these studies provide valuable insights regarding the outcomes of BI adoption, they offer limited understanding of the underlying organizational processes through which data-driven insights are transformed into dynamic capabilities. Consequently, the internal mechanisms linking Business Intelligence to organizational adaptation often remain a "black box" within the literature [12, 14].

Second, existing studies have largely concentrated on manufacturing, finance, banking, and technology sectors, whereas tourism and hospitality remain comparatively underexplored despite their strong dependence on information and data analytics. Tourism organizations operate in unique environments characterized by service intangibility, fluctuating demand, customer co-creation of value, and extensive digital interactions. These characteristics suggest that the role and implementation of Business Intelligence may differ significantly from those observed in other industries [5, 6]. Consequently, there is a need for context-specific investigations that explore how BI is utilized within tourism organizations and how it contributes to organizational adaptation and competitiveness.

Third, the increasing integration of artificial intelligence, predictive analytics, and intelligent decision-support systems has transformed the nature of Business Intelligence itself. Modern tourism organizations increasingly employ AI-powered recommendation systems, dynamic pricing algorithms, sentiment analysis tools, and predictive forecasting models. These technologies create new opportunities for enhancing customer experiences, improving operational efficiency, and supporting sustainable tourism development [7, 9]. However, the organizational processes through which these technologies influence strategic agility and dynamic capabilities remain insufficiently explained.

The Iranian tourism industry provides a particularly valuable context for examining these issues. The sector possesses substantial growth potential due to the country's rich historical, cultural, natural, and medical tourism resources. At the same time, tourism organizations in Iran operate under conditions of considerable environmental uncertainty arising from economic fluctuations, exchange-rate volatility, international sanctions, policy changes, and periodic external shocks. Such circumstances create a highly turbulent environment in which organizational survival depends heavily on the ability to process information effectively and adapt rapidly to changing conditions [19, 20]. The coexistence of digital transformation and environmental turbulence makes the Iranian tourism industry an especially relevant setting for investigating the role of Business Intelligence in fostering dynamic capabilities.

Moreover, the expansion of online booking platforms, digital marketing channels, customer analytics systems, and smart tourism technologies has generated unprecedented opportunities for tourism organizations to leverage data for strategic purposes. Yet organizations vary considerably in their levels of digital maturity, analytical capability, and data-driven decision-making practices. While some firms have successfully integrated Business Intelligence into strategic planning and operational management, others continue to rely predominantly on intuition-based decision-making. Understanding the factors that shape these differences and the processes through which BI becomes institutionalized within organizations represents an important theoretical and practical challenge [5, 6, 20].

Given these considerations, there is a need for qualitative and theory-building research capable of uncovering the organizational processes that connect Business Intelligence with the development of dynamic capabilities in tourism organizations. A grounded theory approach offers particular value in this regard because it enables researchers to move beyond predefined theoretical assumptions and generate explanations directly from the lived experiences of managers and practitioners. Such an approach can reveal how organizations interpret, utilize, and institutionalize Business Intelligence in practice and how these processes contribute to strategic agility, adaptability, and competitive advantage in dynamic tourism environments.

Therefore, the aim of the present study is to develop a grounded theoretical explanation of how Business Intelligence contributes to the development of dynamic capabilities in organizations operating within Iran's tourism and hospitality industry.

Methodology

This study adopted a qualitative research approach and was grounded in the Grounded Theory methodology. From an epistemological perspective, the research was situated within the interpretivist paradigm, which assumes that organizational reality is socially constructed through the interactions, experiences, and interpretations of organizational actors rather than existing as a singular objective phenomenon (Creswell & Creswell, 2018). Such a perspective was considered particularly

appropriate for investigating Business Intelligence (BI) because the value and effectiveness of BI systems are not determined solely by technological infrastructure but are largely shaped by how organizational members interpret, utilize, and integrate analytical information into strategic decision-making processes. Consistent with this philosophical stance, the study embraced a relativist ontology, acknowledging the existence of multiple realities regarding the ways in which tourism organizations create value from data and transform analytical insights into organizational capabilities.

The research design was based on the systematic version of Grounded Theory developed by Strauss and Corbin (1998). This approach was selected because it provides a structured framework for uncovering process-oriented explanations and for developing theory inductively from empirical data. While previous studies in tourism and information systems have frequently relied on technology acceptance models and quantitative causal frameworks, the mechanisms through which BI-generated information becomes embedded in organizational routines and contributes to dynamic capabilities have remained largely unexplored. Grounded Theory offered a suitable methodological framework for examining these underlying processes and for generating a context-sensitive theoretical explanation of how BI contributes to sensing opportunities and threats, seizing opportunities, and reconfiguring organizational resources.

The empirical context of the study was the Iranian tourism and hospitality industry. This setting was selected because it represents a highly dynamic and complex environment characterized by substantial environmental turbulence. Tourism organizations in Iran operate under conditions shaped by fluctuating exchange rates, international sanctions, financial constraints, changing tourism policies, and periodic crises such as the COVID-19 pandemic. Simultaneously, the industry has experienced significant digital transformation through the expansion of online reservation platforms, hotel management systems, customer relationship management systems, and other data-intensive technologies. These developments have generated extensive volumes of customer and market data, creating a unique environment for examining the role of BI in organizational adaptation and strategic agility.

The study population consisted of senior executives, strategic decision-makers, information technology managers, digital marketing managers, and senior data analysts working in major tourism organizations across Iran, including four- and five-star hotel chains, large online reservation platforms, and prominent travel agencies. Participants were selected based on their direct involvement with organizational data and their active role in strategic decision-making processes. Sampling followed the principles of Grounded Theory and was conducted in two stages. Initially, purposive sampling was employed to identify information-rich participants whose organizations had utilized BI systems, analytical dashboards, or data analytics platforms for at least two years. As data collection and analysis progressed simultaneously, the sampling strategy evolved into theoretical sampling (Corbin & Strauss, 2015). Subsequent participants were selected according to emerging concepts and categories identified during the coding process. This iterative procedure enabled the researcher to refine conceptual categories, explore variations in organizational experiences, and examine emerging relationships among concepts. Data collection continued until theoretical saturation was achieved, meaning that additional interviews no longer generated new conceptual insights, properties, or dimensions. Theoretical saturation was reached after conducting 21 in-depth interviews with managers and specialists from the tourism and hospitality sector.

The primary data collection method was in-depth semi-structured interviewing. This technique enabled the researcher to maintain a consistent focus on the research objectives while retaining sufficient flexibility to pursue unexpected themes and explore participants' unique experiences in greater depth. Prior to the main fieldwork, an interview guide was developed

through an extensive review of the literature on Business Intelligence, dynamic capabilities, digital transformation, and strategic management. The guide was further refined through consultation with qualitative research experts and pilot-tested through two preliminary interviews. Feedback from these pilot interviews was used to clarify terminology, improve question sequencing, and adapt the interview protocol to the specific context of the tourism industry.

Interviews were conducted either face-to-face or through online communication platforms depending on participants' geographic locations and preferences. Each interview lasted approximately 60 to 90 minutes. At the beginning of every session, participants were provided with an overview of the research objectives and key concepts, including Business Intelligence and dynamic capabilities, to establish a common frame of reference. Interviews began with broad questions regarding participants' professional backgrounds and experiences with organizational data. As the conversation progressed, more focused questions explored the adoption and implementation of BI systems, the alignment of BI initiatives with organizational strategies, the identification and analysis of market signals and customer behavior through data analytics, and the use of BI-generated insights in strategic decision-making under conditions of market uncertainty.

Additional discussions focused on the role of BI in facilitating organizational adaptation, resource allocation, service redesign, pricing strategies, customer experience management, and organizational learning. Participants were also asked to reflect on the cultural, technological, and structural barriers that hinder the effective transformation of analytical information into strategic action. These conversations generated rich descriptions of organizational practices, managerial interpretations, and contextual influences shaping BI utilization.

With participants' informed consent, all interviews were audio-recorded and subsequently transcribed verbatim immediately after completion. In addition to audio recordings, extensive field notes were maintained throughout the data collection process. These notes documented non-verbal cues, communication styles, contextual observations, and preliminary analytical reflections. The researcher also engaged in continuous memo writing, recording emerging ideas, conceptual insights, potential relationships among categories, and questions for subsequent interviews. These memos served as an important analytical tool and contributed significantly to maintaining the iterative and reflexive nature of the Grounded Theory process.

Data analysis was conducted according to the systematic Grounded Theory procedures proposed by Strauss and Corbin (1998). Analysis occurred concurrently with data collection, allowing emerging findings to inform subsequent interviews and theoretical sampling decisions. The overall objective of the analytical process was to move progressively from raw empirical data to higher levels of conceptual abstraction and ultimately develop a substantive theory explaining how Business Intelligence contributes to the development of dynamic capabilities within tourism organizations.

The analytical procedure consisted of three interconnected stages: open coding, axial coding, and selective coding. During open coding, interview transcripts were examined line by line and incident by incident to identify meaningful concepts embedded within participants' narratives. Initial codes were generated inductively from the data and continuously compared across interviews through the constant comparative method. Similar concepts were grouped together, while distinctions between concepts were carefully documented to preserve conceptual richness.

During axial coding, relationships among categories and subcategories were systematically explored using the Strauss and Corbin paradigm model. This stage involved identifying causal conditions, contextual conditions, intervening conditions, action and interaction strategies, and consequential outcomes associated with the use of Business Intelligence. Through this

process, fragmented concepts were integrated into broader explanatory categories, allowing the researcher to construct a coherent understanding of the organizational mechanisms underlying BI utilization.

Selective coding represented the final stage of analysis and focused on identifying and refining the core category that unified all major concepts and relationships within the emerging theoretical framework. Continuous comparison, memo analysis, and iterative refinement enabled the integration of all categories into a comprehensive explanatory model. The resulting theory illustrated how organizations institutionalize data-driven strategic agility through the use of BI systems and how this process supports the development of sensing, seizing, and reconfiguring capabilities under conditions of environmental turbulence.

To ensure methodological rigor and trustworthiness, several quality assurance strategies were employed throughout the research process. Credibility was enhanced through member checking, whereby preliminary interpretations and emerging categories were reviewed by selected participants to confirm their consistency with lived experiences. Dependability was strengthened through systematic documentation of analytical decisions and the maintenance of a comprehensive audit trail. Confirmability was supported through continuous memo writing and transparent linkage between empirical evidence and theoretical interpretations. Transferability was facilitated through rich contextual descriptions of the research setting, participants, and organizational environments, enabling readers to assess the applicability of the findings to similar contexts. Collectively, these procedures enhanced the analytical rigor of the study and ensured that the emergent theory was firmly grounded in empirical evidence.

Findings and Results

Open coding was the first step in data analysis, during which the interview texts were examined line by line. The purpose of this stage was to break down the data into smaller conceptual units and extract the implicit meanings embedded in the participants' statements. In this process, the researcher attempted to derive concepts directly from the data without imposing any prior theoretical assumptions.

In practice, every phrase or statement that reflected an organizational experience, attitude, or action related to data use and information analysis was recorded as an initial code. For example, phrases such as "daily review of reservation data," "analysis of customer behavior on social media," "use of managerial dashboards for rapid decision-making," and "price adjustment based on demand patterns" were identified as initial codes.

At this stage, an effort was made to use codes close to the participants' own language, namely in vivo codes, in order to preserve the meaning of their experiences accurately. In addition, throughout the coding process, the researcher continuously recorded theoretical memos to document initial ideas regarding the relationships among concepts. At the end of this stage, a considerable number of initial codes were extracted, reflecting various dimensions of organizations' experiences in using data and information analytics. These codes formed the basis for the development of conceptual categories in the next stage.

In axial coding, the focus of analysis shifted from identifying individual concepts to discovering relationships among categories. At this stage, the initial codes were classified into subcategories and then into main categories based on conceptual similarities. The purpose of this process was to reconstruct the data within a coherent and meaningful structure. Strauss and Corbin use the paradigm model to organize relationships among categories. According to this model, the central

phenomenon is analyzed within a set of causal conditions, contextual conditions, intervening conditions, action/interaction strategies, and consequences. In this study, axial analysis showed that the use of Business Intelligence in tourism organizations is shaped by a set of environmental and organizational conditions. For example, competitive pressure, demand fluctuations, and the increasing complexity of customer behavior were among the causal conditions that pushed organizations toward the use of data analytics tools. On the other hand, factors such as the level of information technology maturity, data-driven organizational culture, and employees' analytical skills functioned as contextual conditions shaping the manner and extent of Business Intelligence utilization. Furthermore, factors such as infrastructural constraints, technology costs, and organizational resistance to change were identified as intervening conditions. In response to these conditions, organizations adopted a set of managerial strategies, including the development of managerial dashboards, analysis of demand trends, personalization of customer services, and revision of pricing policies. The outcomes of these strategies included increased organizational agility in decision-making, improved service innovation, and enhanced organizational capacity to adapt to environmental changes. In this section, the indicators of the Grounded Theory paradigm are presented.

Table 1

Axial Codes Extracted from Tourism Experts' Views: Central Phenomenon

Main Indicator	Sub-Indicators		
Institutionalization of data-driven strategic agility	of	data-driven	Evidence-based decision-making maturity: a decisive transition from traditional/intuitive management to decision-making layers based on statistical analyses.
Institutionalization of data-driven strategic agility	of	data-driven	Real-time operational transparency: creation of a digital "war room" in which all organizational units, including reservation, housekeeping, and finance, are visible to one another in real time.
Institutionalization of data-driven strategic agility	of	data-driven	Absorptive capacity: the organization's ability to recognize the value of new information and transform it into actionable knowledge.

In the analysis of interview data, the most important category around which other categories were formed was the institutionalization of data-driven strategic agility. This category reflects the transition of tourism organizations from an intuitive and experience-based managerial model to an analytics-oriented and evidence-based decision-making system. In this situation, data are regarded not merely as an informational resource but as a strategic organizational asset. The first dimension of this phenomenon is evidence-based decision-making maturity. Organizations that use Business Intelligence tools are able to systematically analyze tourists' behavioral patterns, demand trends, and market changes and make managerial decisions based on statistical analyses. This reduces exclusive reliance on managers' individual experience. The second dimension is real-time operational transparency. Through the deployment of managerial dashboards and the integration of organizational data, managers can monitor the performance status of different units, such as reservation, finance, and services, in real time. Such a situation creates a kind of "digital war room" that enables rapid responses to environmental changes. The third dimension is absorptive capacity. Within this framework, the organization not only collects new data but also acquires the ability to interpret, integrate, and transform them into practical knowledge. This capacity allows the organization to convert environmental information into actionable strategic insights. Overall, the institutionalization of Business Intelligence functions as a mechanism for reconfiguring dynamic capabilities and enables faster organizational adaptation to changes in the tourism market.

Table 2*Axial Codes Extracted from Tourism Experts' Views: Causal Conditions*

Main Indicator	Sub-Indicators
Market turbulence and the big-data ecosystem of tourism	Customer digital footprint: the explosion of information on platforms such as TripAdvisor, Jabama, and Instagram, whose manual management has become impossible.
Market turbulence and the big-data ecosystem of tourism	Demand uncertainty in Iran's tourism industry: sudden fluctuations in exchange rates, political conditions, and seasonal changes that have rendered traditional forecasting ineffective.
Market turbulence and the big-data ecosystem of tourism	Smart competitive pressure: the emergence of new competitors that capture market share through dynamic pricing algorithms.

Causal conditions refer to the factors that drive organizations toward the adoption and institutionalization of Business Intelligence. The analysis of interviews showed that the increasing complexity of the competitive environment and the growth of digital data were the most important drivers of this transformation. One of these factors is the expansion of customers' digital footprint. Today's tourists leave extensive informational traces across various environments, such as social networks, online reservation systems, and service evaluation platforms. The volume and diversity of these data have made traditional information management inefficient and have compelled organizations to use advanced analytical tools. The second factor is uncertainty and instability of demand in Iran's tourism industry. Exchange rate fluctuations, political conditions, and sudden changes in travel patterns have caused traditional forecasts based on past experience to lose their effectiveness. Under such conditions, organizations turn to big data analytics and algorithmic forecasting to reduce uncertainty. The third factor is smart competitive pressure. The emergence of new actors in the tourism industry that use technologies such as dynamic pricing algorithms and customer behavior analytics has intensified competition. This situation forces traditional organizations to adopt data-driven approaches in order to maintain their market share.

Table 3*Axial Codes Extracted from Tourism Experts' Views: Contextual Conditions*

Main Indicator	Sub-Indicators
Structural readiness and organizational digital maturity	Strategic orientation toward technology: the extent to which senior management believes that technology is not a "cost" but a "strategic investment."
Structural readiness and organizational digital maturity	Legacy systems: the status of outdated software systems and their flexibility for connection to modern BI gateways.
Structural readiness and organizational digital maturity	Data cultivation culture: the existence of a spirit of questioning and analysis among organizational experts, that is, whether personnel fear data or work with it.

Contextual conditions refer to the organizational settings that influence the formation of the central phenomenon. The findings indicate that the level of digital maturity in organizations plays a decisive role in the successful implementation of Business Intelligence.

The first dimension of this context is strategic orientation toward technology. Organizations that regard information technology as a strategic investment are more inclined to develop data-driven infrastructures. By contrast, organizations that view technology merely as an operational cost are less likely to move toward analytical innovations. The second dimension is legacy systems. Many tourism organizations use outdated software systems that cannot be connected to modern analytical systems. This issue can slow down the pace of digital transformation.

The third dimension is a data cultivation culture within the organization. In organizations where employees are familiar with data analysis and where a spirit of questioning and analysis has been strengthened, the adoption of analytical technologies encounters less resistance.

Table 4*Axial Codes Extracted from Tourism Experts' Views: Intervening Conditions*

Main Indicator	Sub-Indicators
Structural barriers and workforce data literacy	Information silos: resistance of different organizational units, such as sales and IT, to sharing data with one another.
Structural barriers and workforce data literacy	Skills gap: shortage of specialists who both understand the tourism industry and are fluent in the language of data science.
Structural barriers and workforce data literacy	Infrastructural and sanctions-related constraints: challenges in accessing valid international licenses or bandwidth limitations that disrupt cloud-based analytics.

Intervening factors are variables that can facilitate or constrain the realization of the central phenomenon. In this study, three key barriers were identified. The first is information silos. In many organizations, data are stored separately across different units, and information sharing among departments faces resistance. This condition prevents the formation of a comprehensive view of organizational performance. The second is the skills gap in data analytics. Many tourism organizations face a shortage of specialists who both have an in-depth understanding of the tourism industry and are proficient in data analysis methods. This skills gap can reduce the effectiveness of Business Intelligence systems. The third is infrastructural and sanctions-related constraints. Challenges related to access to some international analytical platforms and information technology infrastructure limitations can create difficulties in the full implementation of data-driven solutions.

Table 5*Axial Codes Extracted from Tourism Experts' Views: Strategies*

Main Indicator	Sub-Indicators
Intelligent resource reconfiguration and proactive analytics	AI-based service reengineering: use of chatbots and recommender systems to offer personalized travel packages.
Intelligent resource reconfiguration and proactive analytics	Dynamic capacity and pricing management, or yield management: real-time adjustment of room or tour rates based on demand forecasts for upcoming days.
Intelligent resource reconfiguration and proactive analytics	Continuous customer experience monitoring through sentiment analysis: automatic analysis of customer review texts to identify service weaknesses before they turn into a brand crisis.

In response to causal conditions and within the framework of contextual conditions, organizations adopt a set of operational strategies to utilize Business Intelligence. One of the most important strategies is AI-based service reengineering. In this approach, recommender systems and chatbots are used to analyze tourists' preferences and provide personalized suggestions. Another strategy is dynamic capacity and pricing management. By using demand forecasting models, organizations can dynamically adjust the prices of their services and make optimal use of existing capacities. In addition, organizations use sentiment analysis to continuously monitor tourists' experiences. The analysis of user comments on social networks and reservation platforms enables the rapid identification of service weaknesses.

Table 6*Axial Codes Extracted from Tourism Experts' Views: Consequences*

Main Indicator	Sub-Indicators
Operational excellence and sustainable competitive advantage	Mass customization: the ability to provide specific services to each tourist at the cost level of mass production.
Operational excellence and sustainable competitive advantage	Strategic resilience: the organization's ability to maintain profitability even under crisis conditions through accurate forecasting.
Operational excellence and sustainable competitive advantage	Enhancement of brand value in the digital space: achieving a superior mental position among tourists due to the accuracy and quality of data-driven services.

The implementation of data-driven strategies brings significant consequences for tourism organizations. The first consequence is mass customization of services. Organizations can provide services tailored to each customer's preferences

based on the analysis of tourists' behavioral data while still benefiting from economies of scale. The second consequence is organizational strategic resilience. Organizations that use predictive analytics have a greater capacity to manage crises and market fluctuations. Finally, the enhancement of brand value in the digital space emerges as one of the most important consequences of this transformation. The provision of accurate, personalized, and responsive services increases tourists' satisfaction and strengthens the brand's position in the competitive market.

Selective coding was the final stage of analysis, during which an attempt was made to integrate all identified categories around a core category. The core category is the concept with the greatest explanatory power in the emerging theory, and all other categories are related to it in some way.

In this study, data analysis showed that the concept of "institutionalization of data-driven decision-making" plays a central role in linking Business Intelligence with the development of dynamic capabilities. In other words, the mere existence of Business Intelligence tools does not by itself lead to competitive advantage; rather, these tools contribute to the development of dynamic capabilities only when they become institutionalized in organizational decision-making processes.

Accordingly, the final conceptual model of the study shows that the systematic use of data and intelligent analytics helps tourism organizations identify environmental changes and customer behavior more rapidly, thereby strengthening sensing capability.

It also helps organizations exploit market opportunities more effectively, thereby strengthening seizing capability.

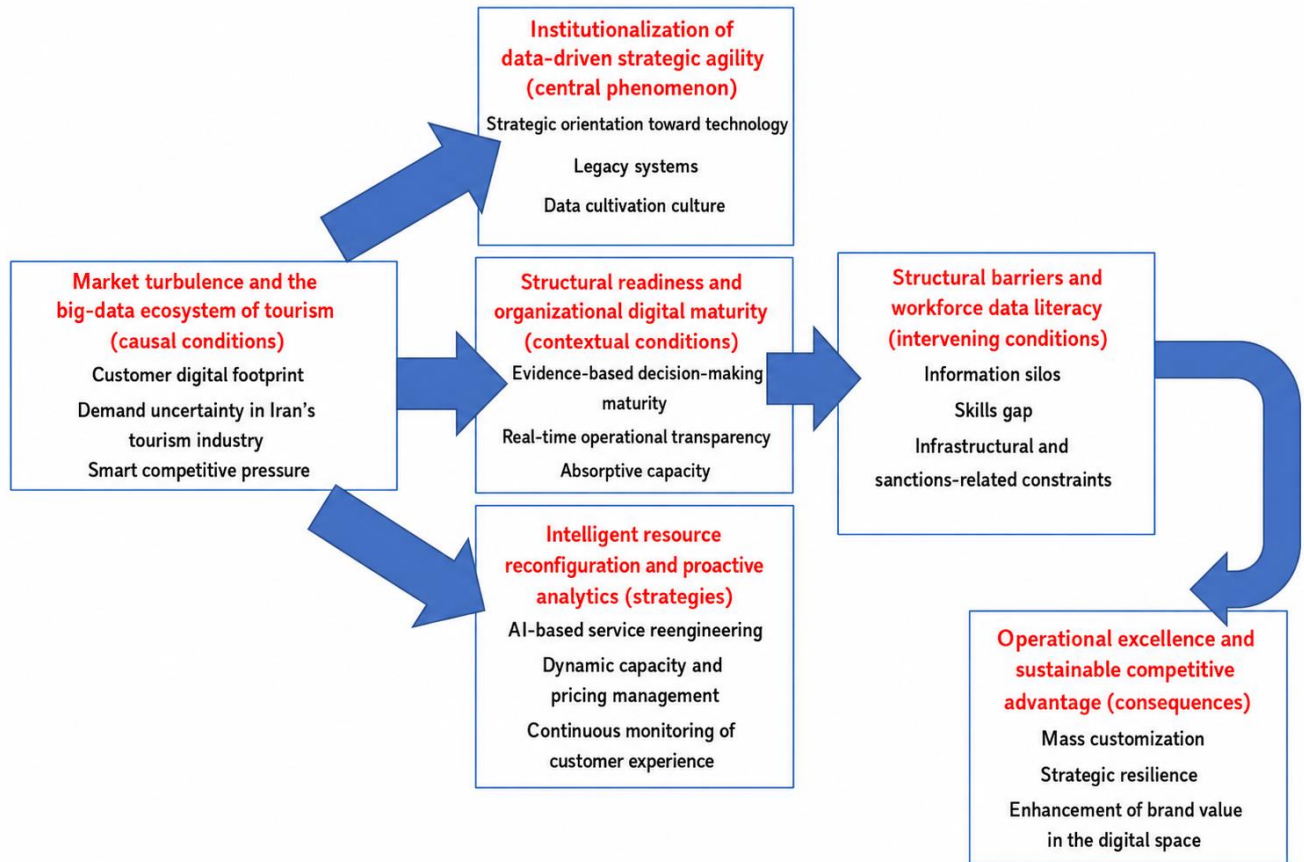
Moreover, it enables organizations to reconfigure organizational resources and processes in accordance with new conditions, thereby strengthening reconfiguring capability.

Thus, the theory emerging from the data indicates that Business Intelligence can function as a key mechanism in the development of dynamic capabilities and the enhancement of strategic agility in tourism organizations.

Table 7

Final Indicators Extracted from Experts' Views Using the Grounded Theory Method

Main Indicator	Sub-Indicators
Institutionalization of data-driven strategic agility: central phenomenon	Evidence-based decision-making maturity
Institutionalization of data-driven strategic agility: central phenomenon	Real-time operational transparency
Institutionalization of data-driven strategic agility: central phenomenon	Absorptive capacity
Market turbulence and the big-data ecosystem of tourism: causal conditions	Customer digital footprint
Market turbulence and the big-data ecosystem of tourism: causal conditions	Demand uncertainty in Iran's tourism industry
Market turbulence and the big-data ecosystem of tourism: causal conditions	Smart competitive pressure
Structural readiness and organizational digital maturity: contextual conditions	Strategic orientation toward technology
Structural readiness and organizational digital maturity: contextual conditions	Legacy systems
Structural readiness and organizational digital maturity: contextual conditions	Data cultivation culture
Structural barriers and workforce data literacy: intervening conditions	Information silos
Structural barriers and workforce data literacy: intervening conditions	Skills gap
Structural barriers and workforce data literacy: intervening conditions	Infrastructural and sanctions-related constraints
Intelligent resource reconfiguration and proactive analytics: strategies	AI-based service reengineering
Intelligent resource reconfiguration and proactive analytics: strategies	Dynamic capacity and pricing management, or yield management
Intelligent resource reconfiguration and proactive analytics: strategies	Continuous customer experience monitoring through sentiment analysis
Operational excellence and sustainable competitive advantage: consequences	Mass customization
Operational excellence and sustainable competitive advantage: consequences	Strategic resilience
Operational excellence and sustainable competitive advantage: consequences	Enhancement of brand value in the digital space

Figure 1*Final Conceptual Model*

Discussion and Conclusion

The purpose of this study was to explain how Business Intelligence contributes to the development of dynamic capabilities within organizations operating in the tourism and hospitality industry. Using a grounded theory approach, the findings revealed that the central phenomenon underlying the relationship between Business Intelligence and organizational adaptation is the institutionalization of data-driven strategic agility. The resulting paradigm model demonstrated that environmental turbulence and the expansion of the tourism big-data ecosystem function as causal conditions that encourage organizations to adopt Business Intelligence practices. At the same time, organizational digital maturity and structural readiness provide the contextual foundation for successful implementation, whereas information silos, skills shortages, and infrastructural limitations act as intervening barriers. In response to these conditions, organizations pursue strategies such as AI-based service reengineering, dynamic pricing and capacity management, and continuous monitoring of customer experiences, ultimately leading to operational excellence, strategic resilience, service personalization, and enhanced brand value.

One of the most significant findings of this study is the identification of institutionalized data-driven strategic agility as the core category linking Business Intelligence to dynamic capabilities. This finding suggests that the mere implementation of analytical technologies is insufficient to generate organizational value. Rather, competitive advantage emerges when data-driven thinking becomes embedded within organizational decision-making routines and strategic processes. In this regard,

Business Intelligence functions not simply as a technological infrastructure but as an organizational capability that reshapes managerial cognition and strategic behavior. This finding is consistent with studies emphasizing that the true value of Business Intelligence lies in its capacity to transform organizational information into actionable strategic knowledge [3, 14]. It also supports the argument that contemporary Business Intelligence systems contribute to organizational learning and strategic responsiveness rather than merely improving operational reporting [1, 4].

The findings further revealed that evidence-based decision-making maturity constitutes a central component of data-driven strategic agility. Tourism organizations that effectively utilize Business Intelligence are capable of replacing intuition-based decisions with systematic analyses of customer behavior, market trends, and demand patterns. This result aligns with previous research suggesting that automated Business Intelligence systems significantly enhance managerial decision quality by providing timely and accurate information for strategic planning [3]. Similarly, studies examining the integration of analytics and predictive modeling have emphasized the importance of data-driven decision-making in reducing uncertainty and supporting organizational innovation [8]. In highly competitive tourism environments, where customer preferences and market conditions change rapidly, evidence-based decision-making becomes particularly valuable for sustaining competitiveness and organizational adaptability.

Another important finding concerns the role of real-time operational transparency. The study showed that Business Intelligence enables the creation of integrated organizational dashboards that provide managers with continuous visibility over organizational performance. Such transparency facilitates rapid responses to environmental changes and enhances coordination across organizational units. This finding corresponds with previous research highlighting the strategic importance of integrating information systems and analytical infrastructures to improve organizational responsiveness and operational effectiveness [14, 17]. It also supports arguments suggesting that digital transformation enables organizations to establish more agile and adaptive decision-making structures [2].

The identification of absorptive capacity as a key dimension of the core phenomenon represents another noteworthy contribution of the study. The findings suggest that organizations derive value from Business Intelligence not merely by collecting data but by developing the ability to interpret, integrate, and transform information into actionable knowledge. This result is consistent with prior studies emphasizing the importance of organizational intelligence, intellectual capital, and knowledge integration in enhancing the effectiveness of Business Intelligence initiatives [11]. Furthermore, research examining Business Intelligence and dynamic capabilities has similarly concluded that analytical capabilities strengthen organizational performance when they facilitate learning, adaptation, and innovation processes [12].

Regarding causal conditions, the findings revealed that market turbulence and the growing tourism data ecosystem constitute major drivers of Business Intelligence adoption. The increasing volume of customer-generated data, the unpredictability of tourism demand, and intensified competitive pressures compel organizations to invest in analytical technologies. These findings are highly consistent with recent studies emphasizing the growing importance of big data analytics in transforming organizational decision-making processes [1]. They also align with research highlighting the strategic necessity of exploiting digital footprints and customer-generated data to enhance competitiveness and improve service delivery [5, 7]. In addition, the role of environmental uncertainty identified in this study reflects broader discussions concerning the need for data-driven approaches in turbulent and rapidly changing business environments [9, 19].

The findings concerning demand uncertainty are particularly relevant in the context of the tourism industry. Tourism markets are highly sensitive to economic fluctuations, political developments, seasonal variations, and unexpected crises. Under such conditions, traditional forecasting methods often become insufficient. The study demonstrated that organizations increasingly rely on predictive analytics and Business Intelligence tools to improve forecasting accuracy and support strategic planning. These findings support previous investigations showing that advanced analytics and predictive modeling enhance organizational capacity to manage uncertainty and identify emerging opportunities [8, 18]. Moreover, recent tourism research suggests that intelligent technologies play a crucial role in supporting adaptive governance and strategic destination management under uncertain conditions [5].

The study also highlighted the importance of contextual conditions, particularly structural readiness and digital maturity. Organizations characterized by strong technological orientations, supportive data cultures, and flexible technological infrastructures were found to be more successful in leveraging Business Intelligence. These findings are consistent with prior studies emphasizing the moderating role of strategic orientation and organizational readiness in determining the effectiveness of Business Intelligence initiatives [15]. Similarly, investigations into online platform adoption and digital transformation in tourism have shown that organizational commitment to technological innovation significantly influences the success of digital initiatives [6]. The importance of data culture identified in the present study also corresponds with literature emphasizing the role of organizational learning and analytical literacy in enhancing Business Intelligence outcomes [11].

Another notable finding concerns the impact of legacy systems on organizational transformation. Many tourism organizations continue to operate with outdated technological infrastructures that limit their ability to integrate modern analytical solutions. This finding aligns with previous studies indicating that technological compatibility and system integration remain critical challenges in Business Intelligence implementation [17]. Organizations that fail to modernize their technological infrastructures may encounter significant difficulties in realizing the full benefits of data-driven management.

The analysis of intervening conditions revealed that information silos, skills gaps, and infrastructural limitations represent major barriers to the successful institutionalization of Business Intelligence. Information silos hinder the sharing and integration of organizational data, reducing the effectiveness of analytical initiatives. This finding supports previous research emphasizing the importance of data governance and integrated information management systems for successful Business Intelligence implementation [16]. Likewise, the identification of skills shortages reflects broader concerns regarding the growing demand for professionals capable of combining domain expertise with advanced analytical competencies [4]. In the tourism context, this challenge is particularly significant because organizations require specialists who understand both tourism operations and data science methodologies.

The findings regarding infrastructural constraints further highlight the contextual realities faced by organizations operating in emerging and developing economies. Limited access to advanced technologies, international analytical platforms, and cloud-based infrastructures can restrict the effectiveness of Business Intelligence initiatives. These findings reinforce previous arguments that technological and environmental conditions substantially influence the success of digital transformation efforts [6, 19].

With respect to organizational strategies, the study found that tourism organizations increasingly employ AI-based service reengineering, dynamic pricing systems, and customer sentiment analysis to leverage Business Intelligence capabilities. These

findings strongly align with recent studies emphasizing the transformative role of artificial intelligence in tourism and hospitality management [7, 9]. The use of recommendation systems, predictive algorithms, and intelligent customer service technologies allows organizations to personalize services and enhance customer experiences. Similarly, the implementation of dynamic pricing strategies reflects broader trends toward algorithm-driven revenue management and data-supported resource optimization [5]. The application of sentiment analysis also corresponds with emerging evidence demonstrating the value of customer-generated content as a source of strategic insight and service improvement [13].

The consequences identified in the present study further demonstrate the strategic value of Business Intelligence. The emergence of mass customization, strategic resilience, and enhanced brand value suggests that data-driven management contributes not only to operational efficiency but also to sustainable competitive advantage. These findings are consistent with previous studies reporting positive relationships between Business Intelligence adoption and organizational performance outcomes [10, 14]. Moreover, the finding that Business Intelligence enhances organizational resilience supports recent research emphasizing the role of analytical technologies in helping organizations anticipate risks, manage crises, and maintain performance under conditions of uncertainty [8, 18].

Overall, the theoretical model developed in this study extends existing literature by demonstrating that Business Intelligence contributes to dynamic capabilities through the institutionalization of data-driven strategic agility. The findings provide empirical support for arguments suggesting that analytical capabilities serve as a foundation for sensing environmental changes, seizing emerging opportunities, and reconfiguring organizational resources [12]. More importantly, the study reveals the organizational mechanisms through which this process occurs, thereby addressing a significant gap in previous research and contributing to a deeper understanding of digital transformation within tourism and hospitality organizations.

Several limitations should be considered when interpreting the findings of this study. First, the research was conducted exclusively within the Iranian tourism and hospitality industry, which may limit the transferability of the findings to other national and institutional contexts. Second, the study relied on qualitative data collected through interviews with managers and experts, making the findings dependent on participants' perceptions and experiences. Third, the cross-sectional nature of the research prevented the observation of how Business Intelligence capabilities and dynamic capabilities evolve over time. Finally, the study focused primarily on organizational and managerial perspectives and did not directly examine customer perceptions or behavioral outcomes associated with data-driven tourism services.

Future studies may examine the proposed conceptual model using quantitative approaches and structural equation modeling to test the relationships identified in the present research. Comparative studies across different countries and tourism markets could also provide valuable insights into the influence of cultural and institutional factors on Business Intelligence adoption. Longitudinal research designs would be particularly useful for exploring how dynamic capabilities emerge and evolve through continuous use of analytical technologies. Additionally, future researchers may investigate the role of emerging technologies such as generative artificial intelligence, digital twins, blockchain systems, and advanced predictive analytics in strengthening strategic agility within tourism organizations.

Managers in tourism and hospitality organizations should view Business Intelligence as a strategic capability rather than merely a technological tool. Investments in data infrastructure should be accompanied by efforts to foster a data-driven culture and strengthen analytical competencies among employees. Organizations should prioritize the integration of

fragmented information systems to reduce information silos and improve cross-functional collaboration. The adoption of predictive analytics, dynamic pricing systems, and customer sentiment analysis can significantly improve responsiveness to market changes and enhance service quality. Finally, senior executives should embed analytical insights into strategic planning processes so that Business Intelligence becomes an integral component of organizational learning, innovation, and long-term competitiveness.

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Authors' Contributions

All authors equally contributed to this study.

Declaration of Interest

The authors of this article declared no conflict of interest.

Ethical Considerations

The study protocol adhered to the principles outlined in the Helsinki Declaration, which provides guidelines for ethical research involving human participants. Written consent was obtained from all participants in the study.

Transparency of Data

In accordance with the principles of transparency and open research, we declare that all data and materials used in this study are available upon request.

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